IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of: **Schmidl et al.**
Serial No.: **09/777,203**
Filed: **February 5, 2001**

Docket: **TI-31284**
Examiner: **Q. Ghulamali**
Art Unit: **2611**
Conf. No.: **3036**

For: **WIRELESS COMMUNICATIONS WITH EFFICIENT CHANNEL CODING**

APPELLANTS' BRIEF

March 1, 2010

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

CERTIFICATION OF FACSIMILE TRANSMITTAL

I hereby certify that the above correspondence is being facsimile transmitted to the U.S. Patent and Trademark Office on March 1, 2010.

Robert N. Rountree

Dear Sir:

In support of their appeal of the Final Rejection of claims in the above-referenced application, Appellants respectfully submit herein their brief.

1. REAL PARTY IN INTEREST

Texas Instruments Incorporated is the real party in interest.

2. RELATED APPEALS AND INTERFERENCES

No other related appeals or interferences are known to Appellants.

3. STATUS OF CLAIMS

Claims 10-22 and 33-51 are pending. Claim 40 is rejected under 35 U.S.C. §102(e). Claims 10-22, 33-39, and 41-51 are rejected under 35 U.S.C. §103(a). Claims 1-9 and 23-32 are cancelled without prejudice.

Examiner in an Office Action of May 28, 2009 made final rejection of claims 10-22 and 33-51. Claims 10-22 and 33-51 are on appeal and are reproduced in the Appendix to Appellants' Brief filed herewith.

4. STATUS OF AMENDMENTS

No amendment was filed subsequent to final rejection.

5. SUMMARY OF CLAIMED SUBJECT MATTER

Independent claim 10 is directed to a data communication apparatus as illustrated at Figure 12B and described at page 14, lines 4-20 of the instant specification. The apparatus includes an input (UNCODED DATA) for receiving original data bits that are to be transmitted via a communication channel to a remote data communication apparatus. An encoder (1210) is coupled to the input for applying an encoding algorithm to the original data bits that produces parity bits. An output is provided (from 1214) for bits that are to be transmitted across the communication channel. A data path is coupled between the encoder and the output. The data path receives information from the remote data communication apparatus (ACK/NAK, page 14, lines 11-20). The data path selects one of the original data bits with Cyclical Redundancy Check (CRC) bits and the parity bits in response to first information (ACK, page 14, lines 10-11). The data path selects the other of the original data bits with CRC bits and the parity bits in response to second information (NAK, page 14, lines 11-20). The selected information is provided to the output for transmission across the communication channel to the remote data communication apparatus.

Independent claim 16 is directed to a data communication apparatus as illustrated at Figure 12A and described at page 12, line 19 through page 14, line 3 of the instant specification. The data communication apparatus includes an input (INCOMMING DATA PACKET) for receiving a received version of original bits with Cyclical Redundancy Check (CRC) bits in response to first information without parity bits produced at a remote data communication apparatus by operation of an encoding algorithm applied to the original bits. (page 14, lines 10-11). The input receives parity bits in response to second information (NAK, page 14, lines 11-20).The original bits with CRC bits and parity bits are transmitted over a communication channel by the remote data communication apparatus. An error detector (1205) is coupled to the input for determining whether the received version of the original data bits is correct in response to the CRC bits. (page 13, lines 1-3). A controller (1206) is coupled to the error detector. In response to a determination that the received version of the original data bits is correct (ACK) it provides first information to the remote data communication apparatus. (page 13, lines 3-5). In response to a determination that the received version of the original data bits is incorrect (NAK) it provides second information to the remote data communication apparatus.

Independent claim 33 is directed to a method of communicating data from a transmitting end (Figure 12B) to a receiving end (Figure 12A) as illustrated by the flow chart of Figure 12 and described at page 11, line 14 through page 12, line 18 of the instant specification. The transmitting end applies to a plurality of original data bits that are to be transmitted to the receiving end an encoding algorithm (120) that produces Cyclical Redundancy Check (CRC) bits and parity bits. (page 11, lines 14-17). The transmitting end transmits the original data bits and the CRC bits without the parity bits in a first transmission to the receiving end. (page 11, lines 17-20). The transmitting end refrains from transmitting the parity bits until the transmitting end receives an indication from the receiving end that the original data bits have not been correctly received at the receiving end. (page 11, lines 18-21).

Independent claim 40 is directed to a method of communicating data from a transmitting end (Figure 12B) to a receiving end (Figure 12A) as illustrated by the flow chart of Figure 12

and described at page 11, line 14 through page 12, line 18 if the instant specification. The receiving end receives from the transmitting end a first transmission including original data bits and Cyclical Redundancy Check (CRC) bits without parity bits produced at the transmitting end by operation of an encoding algorithm applied to the original data bits. (page 14, lines 10-11). The receiving end determines whether the original data bits have been received correctly in response to the CRC bits. (CRC CORRECT?). In response to a determination that the original data bits have not been received correctly, the receiving end transmits to the transmitting (122) end a request for transmission of the parity bits. (page 11, lines 18-20).

Independent claim 42 is directed to a method of transmitting data as illustrated by the flow chart of Figure 12 and described at page 11, line 14 through page 12, line 18 of the instant specification. The method includes applying an encoding algorithm (120) that produces parity bits to a plurality of original data bits that are to be transmitted. (page 11, lines 14-17). The original data bits with Cyclical Redundancy Check (CRC) bits and without the parity bits are transmitted in a first transmission. (page 14, lines 10-11). The parity bits are not transmitted until there is an indication that the original data bits have not been correctly received. (page 11, lines 18-20).

Independent claim 46 is directed to a method of receiving data as illustrated by the flow chart of Figure 12 and described at page 11, line 14 through page 12, line 18 of the instant specification. The method includes receiving a first transmission including original data bits and Cyclical Redundancy Check (CRC) bits without parity bits produced by operation of an encoding algorithm applied to the original data bits. (page 14, lines 10-11). The method further includes determining that the original data bits have not been received correctly in response to the CRC bits (122). A request for transmission of parity bits is transmitted in response to the determination that the data bits have not been received correctly. (page 11, lines 18-20).

6. GROUNDS FOR REJECTION TO BE REVIEWED ON APPEAL

A. Claims 40 is rejected under 35 U.S.C. § 102(e) as being anticipated by Osthoff et al. (U.S. Pat. No. 6,126,310).

B. Claims 10-15 and 16-22 are rejected under 35 U.S.C. § 103(a) as being unpatentable over by Osthoff et al. (U.S. Pat. No. 6,126,310) in view of Lockhart et al. (U.S. Pat. No. 6,161,207).

C. Claims 33-39, 42-45, and 46-51 are rejected under 35 U.S.C. § 103(a) as being unpatentable over by Rogard (U.S. Pat. No. 4,718,066) in view of Osthoff et al. (U.S. Pat. No. 6,126,310).

7. ARGUMENT

A. Claims 40 is rejected under 35 U.S.C. § 102(e) as being anticipated by Osthoff et al. (U.S. Pat. No. 6,126,310). Claim 40 recites "A method of communicating data from a transmitting end to a receiving end, comprising: the receiving end receiving from the transmitting end a first transmission including original data bits and Cyclical Redundancy Check (CRC) bits without parity bits produced at the transmitting end by operation of an encoding algorithm applied to the original data bits; **the receiving end determining whether the original data bits have been received correctly in response to the CRC bits** and, responsive to a determination that the original data bits have not been received correctly, the receiving end transmitting to the transmitting end a request for transmission of the parity bits." (emphasis added).

1) Examiner mistakenly cites col. 2, lines 1-12 of Osthoff et al. as disclosing "a first transmission including original data bits and Cyclical Redundancy Check (CRC) bits." Examiner further cites col. 8, lines 31-47 and 48-60 as disclosing "responsive to a determination that the original data bits have not been received correctly, the receiving end transmitting to the transmitting end a request for transmission of the parity bits." (Office Action 5/28/09, page 11). However, Examiner fails to find any disclosure of the foregoing emphasized limitation. Appellants respectfully submit that Osthoff et al. DO NOT disclose "the receiving end determining whether the original data bits have been received correctly in response to the CRC

bits" as required by claim 40. Thus, claim 40 is patentable under 35 U.S.C. §102(e) over Osthoff et al. Moreover, claim 41 is patentable as depending from patentable claim 40.

2) Examiner mistakenly concludes "Osthoff also discloses as shown in fig. 1a, receiver comprises an error check means **(cyclic error check)** ECM which performs an error check algorithm on the original or multiple corrected information bits IB stored in the register (buffer) IB-R." Osthoff et al. DO NOT disclose that the ECM performs a "cyclic error check" or that it even receives CRC bits. These are Examiner's words and not a part of the disclosure of Osthoff et al.

3) Examiner errs in stating that "Even parity is a special case of a cyclic redundancy check (CRC)." Once again, these are Examiner's words and not a part of the disclosure of Osthoff et al. In fact, Osthoff et al. specifically differentiate between CRC bits of the prior art (col. 2, lines 6-14) and parity bits (col. 8, lines 31-47 and 48-60). Osthoff et al., therefore, specifically disagree with Examiner.

For all the foregoing reasons, Appellants respectfully that claim 40 is patentable under 35 U.S.C. §102(e) over Osthoff et al. Moreover, claim 41 is patentable as depending from patentable claim 40.

B. Claims 10-15 and 16-22 are rejected under 35 U.S.C. § 103(a) as being unpatentable over by Osthoff et al. (U.S. Pat. No. 6,126,310) in view of Lockhart et al. (U.S. Pat. No. 6,161,207).

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. (MPEP § 2143). Appellants respectfully submit that examiner has failed to meet the first and third criteria. Moreover, the examiner bears the initial burden of factually supporting

any *prima facie* conclusion of obviousness. If the Examiner does not produce a *prima facie* case, the Appellants are under no obligation to submit evidence of nonobviousness. "To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references." *Ex parte Clapp*, 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985). (MPEP § 2142). Examiner has failed to establish a *prima facie* case of obviousness for the following reasons.

1. SUGGESTION OR MOTIVATION TO COMBINE REFERENCES

Examiner states "It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a selective transmission means to transmit the other of original data bits and overhead bits in response to a second information (negative acknowledgement NACK) as taught by Lockhart in the system of Osthoff because it can provide many of the benefits of selective transmission without the additional overhead of prior block error detection codes with reasonably expected increase of coverage of data modem by several decibels." (Office Action 5/28/09, page 13). Appellants respectfully submit that these are Examiner's words based on improper hindsight and not the disclosure of Lockhart et al. of Osthoff et al. Examiner fails to offer any rationale for modifying either disclosure to produce the present invention. A statement that modifications of the prior art to meet the claimed invention would have been "well within the ordinary skill of the art at the time the claimed invention was made" because the references relied upon teach that all aspects of the claimed invention were individually known in the art is not sufficient to establish a *prima facie* case of obviousness without some objective reason to combine the teachings of the references. *Ex parte Levengood*, 28 USPQ2d 1300 (Bd. Pat. App. & Inter. 1993).

Referring to Figure 1a-1b and col. 8, lines 28-58, Osthoff et al. disclose sending a new data packet that may or may not contain parity (PA) bits at step ST1. The Honorable Board will please note that Osthoff et al. say nothing about CRC bits in this new packet as required by

claims 10 and 16. When errors are detected in step ST3 and there is no improvement, then a complete retransmission of the packet is requested in step ST7. (col. 8, lines 49-51). If there is a steady improvement or there are few errors, then additional parity bits may be requested at step ST6. (col. 8, lines 52-54). By way of comparison, Lockhart et al. disclose (Figure 3) sending a packet with a header and four sub-portions 200. The receiver does not know which sub-portion contains an error and generates a return packet (210) with a header and CRC codes (212-215). (col. 3, line 65 through col. 4, line 3). The sender receives this NAK messages and generates a CRC code for each sub-portion from each original sub-portion 202-205. Then the sender compares this generated CRC code with the packet (210) to determine which sub-portion has the error. (col. 4, lines 8-16). Then the entire sub-portion is retransmitted (220).

Osthoff et al. disclose sending more parity bits when there are only a few errors in the original data packet. Osthoff et al. do not teach an advantage to omission of parity bits in the original packet and state that they may or may not be present. Furthermore, Osthoff et al. are silent on CRC codes as a method to determine if the packet contains errors. Lockhart et al. teach the use of CRC codes, but it is the sender that determines which sub-portion of the packet has the error. The sender then retransmits the entire sub-portion. Lockhart et al. do not disclose that the sender transmits additional parity bits in response to a NAK. Appellants respectfully submit, therefore, that one of ordinary skill in the art would not think co combine Osthoff et al. with Lockhart et al. to produce the present invention for at least the following reasons.

First, Osthoff et al. use parity bits to detect errors. Lockhart et al. use CRC codes. There is no reason one of ordinary skill in the art would think to use both apart from improper hindsight in view of the instant specification.

Second, Osthoff et al. disclose transmission of additional parity bits when there are few errors in the original data packet. Lockhart et al. disclose retransmission of an entire sub-portion of data and are silent on parity bits.

Third, Lockhart et al. teach that the transmitter must generate CRC codes to identify which sub-portion of the original packet has errors. The receiver does not know which portion of the original sub-portion has errors.

Finally, even an improper combination of Osthoff et al. with Lockhart et al. does not disclose using CRC codes to identify packet errors in a packet with no parity bits at a receiver. Moreover, even such an improper combination does not teach request transmitting parity bits for the original data packet in response to the CRC error detection.

Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. "The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art." *In re Kotzab,* 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). Here, there is no teaching or suggestion to combine Osthoff et al. with Lockhart et al. apart from improper hindsight in view of the instant specification. Thus, claims 10 and 16 and their respective depending claims are patentable under 35 U.S.C. § 103(a).

2. ALL CLAIM LIMITATIONS

To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). "All words in a claim must be considered in judging the patentability of that claim against the prior art." *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970).

Independent claim 10 recites "A data communication apparatus, comprising: an input for receiving original data bits that are to be transmitted via a communication channel to another data communication apparatus; an encoder coupled to said input for applying to the original data bits

an encoding algorithm that produces parity bits; an output for providing bits that are to be transmitted across the communication channel; and a data path coupled between said encoder and said output, said data path receiving information from said another data communication apparatus, said data path **selecting one of the original data bits with Cyclical Redundancy Check (CRC) bits and the parity bits in response to a first information**, said data path **selecting the other of the original data bits with CRC bits and the parity bits in response to a second information**, to be provided to said output for transmission across the communication channel to said another data communication apparatus." (emphasis added).

Independent claim 16 recites "A data communication apparatus, comprising: an input for **receiving a received version of original bits with Cyclical Redundancy Check (CRC) bits in response to a first information without parity bits** produced at another data communication apparatus by operation of an encoding algorithm applied to the original bits, said input **receiving said parity bits in response to a second information**, said original bits with CRC bits and parity bits transmitted over a communication channel by said another data communication apparatus; an error detector coupled to said input for determining whether the received version of the original data bits is correct in response to the CRC bits; and a controller coupled to said error detector, responsive to a determination that the received version of the original data bits is correct for providing said first information to said another data communication apparatus, and responsive to a determination that the received version of the original data bits is incorrect for providing said second information to said another data communication apparatus." (emphasis added).

Examiner errs in referring to "overhead bits," which are not found in any of the claims. (Office Action 5/28/09, page 12). The foregoing emphasized limitations are explained in detail at page 11, line 14 and following of the instant specification with reference to Figure 12. As previously discussed with regard to claim 40, neither Osthoff et al. nor Lockhart et al. disclose these features of the claimed invention. Furthermore, Examiner provides several citations from Lockhart et al. but fails to identify 1) a data path, 2) a first information, 3) a second information, 4) transmission of original data bits with CRC bits in response to one of first or second information, or

5) transmission of parity bits in response to the other of first or second information. Appellants respectfully submits that these omitted claim limitations are an admission that the proposed combination of Osthoff et al. with Lockhart et al. DO NOT disclose the foregoing emphasized limitations of claims 10 and 16. For all the foregoing reasons, therefore, claims 10-22 are patentable under 35 U.S.C. §103(a).

Appellants acknowledge the rejections of depending claims 11-15 and 17-22 under 35 U.S.C. § 103(a) and respectfully submit they are patentable as depending from patentable claims.

C. Claims 33-39, 42-45, and 46-51 are rejected under 35 U.S.C. § 103(a) as being unpatentable over by Rogard (U.S. Pat. No. 4,718,066) in view of Osthoff et al. (U.S. Pat. No. 6,126,310). Claim 33 recites "A method of communicating data from a transmitting end to a receiving end, comprising: the transmitting end applying to a plurality of original data bits that are to be transmitted to the receiving end an encoding algorithm that produces Cyclical Redundancy Check (CRC) bits and parity bits; **the transmitting end transmitting the original data bits and the CRC bits without the parity bits in a first transmission** to the receiving end; and **the transmitting end refraining from transmitting the parity bits until the transmitting end receives an indication from the receiving end that the original data bits have not been correctly received** at the receiving end." (emphasis added).

Claim 42 recites "A method of transmitting data, comprising: applying an encoding algorithm that produces parity bits to a plurality of original data bits that are to be transmitted; **transmitting the original data bits with Cyclical Redundancy Check (CRC) bits without the parity bits in a first transmission**; and **refraining from transmitting the parity bits until receiving an indication that the original data bits have not been correctly received.**" (emphasis added).

Claim 46 recites "A method of receiving data, comprising: **receiving a first transmission including original data bits and Cyclical Redundancy Check (CRC) bits without parity bits** produced by operation of an encoding algorithm applied to the original data

bits; **determining that the original data bits have not been received correctly in response to the CRC bits**; and **transmitting a request for transmission of parity bits responsive to the step of determining.**" (emphasis added).

Examiner admits that Rogard does not disclose the foregoing emphasized limitations. (Office Action 5/28/09, page 5). Examiner relies on Osthoff et al. for the emphasized claim limitations. Osthoff et al., however, fail to disclose the foregoing emphasized limitations. Osthoff et al. disclose sending more parity bits when there are only a few errors in the original data packet. Osthoff et al. do not teach an advantage to omission of parity bits in the original packet and state that they may or may not be present. Furthermore, Osthoff et al. are silent on CRC codes as a method to determine if the packet contains errors. Even an improper combination of Rogard with Osthoff et al. does not produce at least the foregoing emphasized limitations of independent claims 33, 42, and 46. Thus, claims 33-39 and 42-51 are patentable under 35 U.S.C. §103(a)

In view of the foregoing, Appellants respectfully request favorable consideration of the appeal from Final Rejection in the above referenced application, its reversal, and allowance of claims 10-21 and 33-51.

Respectfully submitted,

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8. APPENDIX

CLAIMS ON APPEAL

Claims 1-9 (Cancelled)

10. (Previously amended) A data communication apparatus, comprising:

an input for receiving original data bits that are to be transmitted via a communication channel to another data communication apparatus;

an encoder coupled to said input for applying to the original data bits an encoding algorithm that produces parity bits;

an output for providing bits that are to be transmitted across the communication channel; and

a data path coupled between said encoder and said output, said data path receiving information from said another data communication apparatus, said data path selecting one of the original data bits with Cyclical Redundancy Check (CRC) bits and the parity bits in response to a first information, said data path selecting the other of the original data bits with CRC bits and the parity bits in response to a second information, to be provided to said output for transmission across the communication channel to said another data communication apparatus.

11. (Previously amended) The apparatus of Claim 10, wherein said data path includes a buffer coupled to said encoder for storing the original data bits and the parity bits.

12. (Previously amended) The apparatus of Claim 11, wherein said data path includes a selector coupled between said buffer and said output, said selector responsive to said information for obtaining one of the original data bits with CRC bits and the parity bits from said buffer to be provided to said output for transmission to said another data communication apparatus.

13. (Previously amended) The apparatus of Claim 10, wherein said first information includes an acknowledgement and said second information includes a negative acknowledgement indicating that an earlier transmission has not been received correctly at said another

communication apparatus, said data path responsive to the negative acknowledgement for changing its selection from one of the original data bits with CRC bits and the parity bits to the other of the original data bits with CRC bits and the parity bits.

14. (Original) The apparatus of Claim 10, provided as a wireless communication apparatus.

15. (Original) The apparatus of Claim 10, wherein said encoder is a convolutional encoder.

16. (Previously amended) A data communication apparatus, comprising:

an input for receiving a received version of original bits with Cyclical Redundancy Check (CRC) bits in response to a first information without parity bits produced at another data communication apparatus by operation of an encoding algorithm applied to the original bits, said input receiving said parity bits in response to a second information, said original bits with CRC bits and parity bits transmitted over a communication channel by said another data communication apparatus;

an error detector coupled to said input for determining whether the received version of the original data bits is correct in response to the CRC bits; and

a controller coupled to said error detector, responsive to a determination that the received version of the original data bits is correct for providing said first information to said another data communication apparatus, and responsive to a determination that the received version of the original data bits is incorrect for providing said second information to said another data communication apparatus.

17. (Previously amended) The apparatus of Claim 16, wherein said input is further for receiving a received version of the parity bits as transmitted from said another data communication apparatus, said controller coupled to said input for applying to the received version of the parity bits a mapping operation which, if the parity bits have been received correctly at the receiving end, will result in the original data bits, said error detector coupled to said controller for applying an error detection procedure to the result of the mapping operation to determine whether the mapping operation has resulted in the original data bits.

18. (Previously amended) The apparatus of Claim 17, including a decoder coupled to said input and said controller, said controller responsive to a determination by said error detector that the mapping operation has not resulted in the original data bits for signaling said decoder to apply to the received version of the original data bits and the received version of the parity bits a decoding algorithm that corresponds to said encoding algorithm.

19. (Previously amended) The apparatus of Claim 18, including a buffer coupled between said input and said decoder for storing the received version of the original bits and the received version of the parity bits for use by said decoder.

20. (Previously amended) The apparatus of Claim 18, wherein said error detector is coupled to said decoder for determining whether said decoding algorithm has resulted in the original data bits, said controller operable in response to a determination that said decoding algorithm has not resulted in the original data bits for providing for transmission to said another data communication apparatus a request for retransmission of the original data bits with CRC bits.

21. (Original) The apparatus of Claim 18, wherein said decoder is a Viterbi decoder.

22. (Original) The apparatus of Claim 16, provided as a wireless communication apparatus.

Claims 23-32 (Cancelled)

33. (Previously added) A method of communicating data from a transmitting end to a receiving end, comprising:

the transmitting end applying to a plurality of original data bits that are to be transmitted to the receiving end an encoding algorithm that produces Cyclical Redundancy Check (CRC) bits and parity bits;

the transmitting end transmitting the original data bits and the CRC bits without the parity bits in a first transmission to the receiving end; and

the transmitting end refraining from transmitting the parity bits until the transmitting end receives an indication from the receiving end that the original data bits have not been correctly received at the receiving end.

34. (Previously added) The method of Claim 33, including the transmitting end transmitting the parity bits to the receiving end in a second transmission in response to an indication from the receiving end that the original data bits have not been correctly received at the receiving end.

35. (Previously added) The method of Claim 34, including the receiving end combining a received version of the original data bits and a received version of the parity bits to produce a combined set of received bits, and the receiving end applying to the combined set of received bits a decoding algorithm that corresponds to said encoding algorithm.

36. (Previously added) The method of Claim 34, including the receiving end applying to a received version of the parity bits a mapping operation which, if the parity bits have been received correctly at the receiving end, will result in the original data bits, and the receiving end applying an error detection procedure to the result of the mapping operation to determine whether the mapping operation has resulted in the original data bits and, in response to a determination that the mapping operation has not resulted in the original data bits, the receiving end combining the received version of the parity bits with a received version of the original data bits to produce a combined set of received bits, and the receiving end applying to the combined set of received bits a decoding algorithm that corresponds to said encoding algorithm.

37. (Previously added) The method of Claim 36, wherein said encoding and decoding algorithms are Viterbi encoding and decoding algorithms.

38. (Previously added) The method of Claim 36, including the receiving end applying an error detection procedure to a result of said decoding algorithm with the CRC bits to determine whether said decoding algorithm has resulted in the original data bits and, in response to a

determination that said decoding algorithm has not resulted in the original data bits, the receiving end transmitting to the transmitting end a request for retransmission of the original data bits.

39. (Previously added) The method of Claim 38, including the transmitting end retransmitting the original data bits to the receiving end and, in response to a determination by the receiving end that said retransmission of the original data bits has not been received correctly, the receiving end combining a received version of the retransmitted original data bits with said received version of the parity bits to produce another combined set of received bits, and the receiving end applying said decoding algorithm to said another combined set of received bits.

40. (Previously added) A method of communicating data from a transmitting end to a receiving end, comprising:

the receiving end receiving from the transmitting end a first transmission including original data bits and Cyclical Redundancy Check (CRC) bits without parity bits produced at the transmitting end by operation of an encoding algorithm applied to the original data bits;

the receiving end determining whether the original data bits have been received correctly in response to the CRC bits and, responsive to a determination that the original data bits have not been received correctly, the receiving end transmitting to the transmitting end a request for transmission of the parity bits.

41. (Previously added) The method of Claim 40, wherein the encoding algorithm is a convolutional encoding algorithm.

42. (Previously added) A method of transmitting data, comprising:

applying an encoding algorithm that produces parity bits to a plurality of original data bits that are to be transmitted;

transmitting the original data bits with Cyclical Redundancy Check (CRC) bits without the parity bits in a first transmission; and

refraining from transmitting the parity bits until receiving an indication that the original data bits have not been correctly received.

43. (Previously added) The method of Claim 42, comprising transmitting the parity bits in a second transmission in response to the indication that the original data bits have not been correctly received.

44. (Previously added) The method of Claim 42, wherein said encoding algorithm is a Viterbi encoding algorithm.

45. (Previously added) The method of Claim 42, comprising retransmitting the original data bits.

46. (Previously added) A method of receiving data, comprising:

receiving a first transmission including original data bits and Cyclical Redundancy Check (CRC) bits without parity bits produced by operation of an encoding algorithm applied to the original data bits;

determining that the original data bits have not been received correctly in response to the CRC bits; and

transmitting a request for transmission of parity bits responsive to the step of determining.

47. (Previously added) The method of Claim 46, wherein the encoding algorithm is a convolutional encoding algorithm.

48. (Previously added) The method of Claim 46, comprising:

combining a received version of the original data bits and a received version of the parity bits to produce a combined set of received bits; and

applying a decoding algorithm that corresponds to said encoding algorithm to the combined set of received bits to produce decoded data bits.

49. (Previously added) The method of Claim 48, comprising:

applying a CRC error detection procedure to the decoded data bits;

determining the decoded data bits are not the same as the original data bits in response to the step of applying; and

transmitting a request for retransmission of the original data bits in response to the step of determining.

50. (Previously added) The method of Claim 48, comprising:

receiving a retransmission of the original data bits and a retransmission of the CRC bits;

determining that said retransmission of the original data bits has not been received correctly in response to the retransmission of the CRC bits;

combining a received version of the retransmitted original data bits with said received version of the parity bits to produce another combined set of received bits; and

applying said decoding algorithm to said another combined set of received bits.

51. (Previously added) The method of Claim 46, comprising:

applying a mapping operation to a received version of the parity bits to produce resultant data bits;

applying a CRC error detection procedure to the resultant data bits;

determining that the resultant data bits are not the same as the original data bits in response to the step of applying a CRC error detection procedure;

combining the received version of the parity bits with a received version of the original data bits to produce a combined set of received bits; and

applying a decoding algorithm that corresponds to said encoding algorithm to the combined set of received bits.

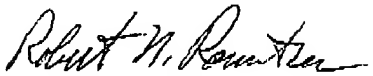
9. EVIDENCE APPENDIX

None.

10. RELATED PROCEEDINGS APPENDIX

None.

Respectfully submitted,



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